PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 5011-012	**FOR FURTHER ACTION** See item 4 below	
International application No. PCT/US2007/075929	International filing date *(day/month/year)* 14 August 2007 (14.08.2007)	Priority date *(day/month/year)* 14 August 2006 (14.08.2006)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant INQUIRA, INC.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 8 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☒	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 17 February 2009 (17.02.2009)
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PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

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PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)* 12 MAR 2008		
Applicant's or agent's file reference 5011-012	FOR FURTHER ACTION See paragraph 2 below	
International application No. PCT/US 07/75929	International filing date *(day/month/year)* 14 August 2007 (14.08.2007)	Priority date *(day/month/year)* 14 August 2006 (14.08.2006)
International Patent Classification (IPC) or both national classification and IPC IPC(8) - G06F 17/20 (2008.01) USPC - 704/1		
Applicant INQUIRA, INC.		

1. This opinion contains indications relating to the following items:

- [x] Box No. I Basis of the opinion
- [ ] Box No. II Priority
- [ ] Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- [ ] Box No. IV Lack of unity of invention
- [x] Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- [ ] Box No. VI Certain documents cited
- [x] Box No. VII Certain defects in the international application
- [ ] Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer:
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	21 January 2008 (21.01.2008)	Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

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International application No. PCT/US 07/75929

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:
   - [x] the international application in the language in which it was filed.
   - [ ] a translation of the international application into ______________ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. [ ] This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of:

   a. type of material
   - [ ] a sequence listing
   - [ ] table(s) related to the sequence listing

   b. format of material
   - [ ] on paper
   - [ ] in electronic form

   c. time of filing/furnishing
   - [ ] contained in the international application as filed
   - [ ] filed together with the international application in electronic form
   - [ ] furnished subsequently to this Authority for the purposes of search

4. [ ] In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

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Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	2-7, 9, 13-15, 17-24	YES
	Claims	1, 8, 10-12, 16	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-24	NO
Industrial applicability (IA)	Claims	1-24	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1, 8, 10-12 and 16 lack novelty under PCT Article 33(2) as being anticipated by US 2006/0136403 A1 (Koo).

As to claim 1, Koo teaches a method for classifying information requests, comprising: receiving a group of text questions logged for one or more servers for a period of time (e.g. words statistically collected from other prior queries by the population around the same keyword, see para [0026]); identifying groups of the logged questions that use a variety of different linguistic expressions to express similar information requests (e.g. an "Intended Concept" includes is a semantic construct defined by a set of attributes that characterize it, see para [0021]); assigning intent categories applicable to each group of questions requesting similar information (e.g. form the theory about her possible diagnoses (i.e., the Intended Concept) based on an ITD graph 400 (FIG. 4). In this graph 400, entering a symptom "A" implies that the user intents to derive a diagnosis, see para [0023]); and configuring intent responses that each provide applicable information to all of the questions assigned to the same intent categories (e.g. Possible intents (disease diagnosis) are then determined (520), see para [0076] and FIG.5).

As to claim 8, Koo teaches the method according to claim 1 including assigning parameters to the intent categories that control how the associated intent responses are displayed (e.g. If there are other intents related to the search term, then the related search terms can also be displayed for selection by the user to narrow down the possible intents, see para [0070]).

As to claim 10, Koo teaches the method according to claim 8 including associating user parameters with the intent categories that cause a search engine to display different information associated with a user submitting the question or associated with a query history associated with the user submitting the question (e.g. form the theory about her possible diagnoses (i.e., the Intended Concept) based on an ITD graph 400 (FIG. 4). In this graph 400, entering a symptom "A" implies that the user intents to derive a diagnosis, see para [0023]).

As to claim 11, Koo teaches the method according to claim 1 including assigning response parameters to the intent responses that cause a search engine to display both the intent responses associated with the intent categories and also display any additional information associated with the response parameters assigned to the intent responses (e.g. the method 500 can include transmitting the search term(s) and/or intent(s) to a search engine to perform the search instead of the performing (580), see para [0076] and FIG.5).

As to claim 12, Koo teaches a method for discovering query intent categories, comprising: logging queries received by an enterprise information system (e.g. words statistically collected from other prior queries by the population around the same keyword, see para [0026] and e.g. a conventional deductive system (expert systems, rule-based production systems, etc.) goes through a chaining process that is typically exponential in computation. In contrast, embodiments of the invention are linear in computation, see para [0027]); using a clustering engine to identify clusters of the logged queries (e.g. approaches, such as "clustering", statistically look for other words that often appear along with or near the keyword in the same query, and present these random words to user as guidance/hints for query expansions, see para [0006]); generating names for the clusters of logged queries (e.g. The search navigator 140, as will be discussed further below, determines possible intents based on a search term and provides additional search terms for selection by the user related to the possible intents, see para [0070]); using the generated names to create intent categories pertinent to the queries in the same clusters (e.g. form the theory about her possible diagnoses (i.e., the Intended Concept) based on an ITD graph 400, see para [0023] and FIG.4); and using a linguistic matching language to match the queries in the same clusters with the intent categories (e.g. By adding a new symptom/concept B, the system eliminates Y as a possible intent and refines the query to be "A+B". In a complex vertical domain, such an expanded or refined query will substantially narrow down the search results by orders of magnitude, see para [0025]).

- Please See Continuation Sheet .

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Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
It is respectfully submitted that two of the submitted claims for this application are in error: Claims Seven (7) and Thirteen (13). As submitted they read as follows:

7. The method according to claim 7 including configuring at least some of the intent categories into an intent hierarchy that causes the intent responses associated with the intent categories to be displayed according to the configured intent hierarchy.

and

13. The method according to claim 13 including using ontology elements associated with the enterprise information system as features for the clustering engine and then using at feast some of the cluster names generated by the clustering engine to create intent categories.

Obviously this is incorrect since both claims depend from themselves. For the purposes of this international search, these have been amended as follows:

7. The method according to claim 6 including configuring at least some of the intent categories into an intent hierarchy that causes the intent responses associated with the intent categories to be displayed according to the configured intent hierarchy.

and

13. The method according to claim 12 including using ontology elements associated with the enterprise information system as features for the clustering engine and then using at feast some of the cluster names generated by the clustering engine to create intent categories.

The reasoning for the above changes is as follows:
For Claim Seven, the incrementally increasing pattern developed in the claims preceding Seven was continued for Claim Seven - i.e. Claims Four, Five and Six each depend from the former. Therefore it was assumed that Claim Seven was intended to have depended from Claim Six.
For Claim Thirteen, it is the first dependent claim under Claim Twelve; the pattern of dependency within Claims Fourteen and Fifteen is one of incremental increasing and thus it was assumed that Claim Thirteen was intended to have depended from Claim Twelve.

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Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:
Box V.2. Citations and explanations:

As to claim 16, Koo teaches a search engine, comprising: a processor configured to receive queries and then conduct a linguistic analysis that identifies different concepts and linguistic formations in the queries (e.g. The CPU 205 may include an INTEL PENTIUM microprocessor, a Motorola POWERPC microprocessor, or any other processor capable to execute software stored in the persistent memory 220, see para [0071] and FIG.2 and e.g. words statistically collected from other prior queries by the population around the same keyword, see para [0026]); the processor further configured to identify the received queries having similar information requests according to the identified concepts and linguistic formations and classify the queries with similar information requests under similar intent categories (e.g. an "Intended Concept" includes is a semantic construct defined by a set of attributes that characterize it, see para [0021]); and the processor further configured to provide common pertinent information responses to all of the similar information requests classified under the same intent categories (e.g. search terms (peer concepts) used to refine a search (assuming the first term or symptom was cough). As the user enters the same word "cough", the system instantly comes up with a comprehensive list of possible Peer-Terms (or co-existent symptoms) for user to choose from, see para [0077] and FIG.6).

Claims 2-7, 9, 13-15, 17-22 and 24 lack inventive step under PCT Article 33(3) as being obvious over Koo in view of US 2005/0267871 A1 to Marchisio et al. (hereinafter .Marchisio.).

As to claim 2, Koo teaches the method according to claim 1 but fails to explicitly teach including: conducting spelling analysis to replace unidentifiable words in the questions; conducting punctuation analysis to correct punctuation in the questions; conducting sentence analysis to identify sentence structures and sentence elements in the questions; conducting a stem analysis to add and identify other forms of words to the questions; conducting a concept analysis using one or more ontologies to identify concepts related to the questions; and conducting a linguistic analysis using the identified concepts, sentence structures, sentence elements, and other added and identified forms of words to identify intent categories for the questions.Marchisio teaches including: conducting spelling analysis to replace unidentifiable words in the questions; conducting punctuation analysis to correct punctuation in the questions (e.g. spell checking, removing excessive white space, removing extraneous punctuation, and/or converting terms to lowercase, uppercase, or proper case, see para [0212] and FIG.29); conducting sentence analysis to identify sentence structures and sentence elements in the questions (e.g. diagram of a sentence that has been indexed and stored in a term-clause index of a Syntactic Query Engine, see para [0215] and FIG.30); conducting a stem analysis to add and identify other forms of words to the questions (e.g. The verb field 3003 includes the stemmed form of the verb term "admires" (the verb), followed by a series of suffix modifiers of the verb, which appear also as parts of prepositional phrases in pcomp field 3005, see para [0215] and FIG.30); conducting a concept analysis using one or more ontologies to identify concepts related to the questions (e.g. the ENLP provides "co-referencing" analysis, which allows the ENLP to replace pronouns with nouns, or nouns, pronoun phrases, noun phrases, aliases, abbreviations, acronyms, etc. with a corresponding identifying noun, see para [0172] and FIG.16); and conducting a linguistic analysis using the identified concepts, sentence structures, sentence elements, and other added and identified forms of words to identify intent categories for the questions (e.g. linguistic normalization is performed to transform the sentence, see para [0012]). It would have been obvious to one of ordinary skill in the art to combine the data set processor of the syntactic query engine of Marchisio with the Intended Concept processor of Koo, to provide the quality and robustness benefit of dissecting the data set into sentence objects in preparation for subsequent linguistic analysis.

As to claim 3, Koo teaches the method according to claim 1 including: identifying the intent categories associated with the largest groups of questions; and posting pre-query information or links on a web page that provide intent responses for the identified intent categories.Marchisio teaches including: identifying the intent categories associated with the largest groups of questions (e.g. Clause and sentence information may indicate, for example, that the clause relative to other clauses in the sentence is a conditional clause, a causal clause, a prepositional clause, or a temporal clause or that the sentence is a question, a definition, or contains temporal or numerical information, see para [0172] and FIG.16); and posting pre-query information or links on a web page that provide intent responses for the identified intent categories (e.g. To discover the details of these relationships, the user navigates to one of the displayed links such as link 6D02 which indicates that Ronald Reagan is the person in common in the indicated (indirect) relationship, see para [0147] and FIG.6D). It would have been obvious to one of ordinary skill in the art to combine Enhanced Natural Language Parser of Marchisio with the Intended Concept processor of Koo, to provide the qualitative benefit derived from the natural language parser of identifying, for each sentence received as input, the part of speech for each term in the sentence and the syntactic relationships among the various terms making up each clause of the sentence.

As to claim 4, Marchisio further teaches the method according to claim 3 including: receiving a new group of questions logged for the one or more servers for another period of time (e.g. The Syntactic Query Engine is useful in a multitude of scenarios that require indexing, storage, and/or searching of, especially large, data sets, because it yields results to queries that are more contextually accurate than other search engines, see para [0088] and e.g. Pressing the History tab 6A06 displays a page that shows a history of prior relationship searches, see para [0144] and FIGS.6A-6G); using natural language analysis to identify new groups of questions not associated with existing intent categories (e.g. an Enhanced Natural Language Parser ("ENLP") 1204, see para [0167]); and assigning new intent categories for the identified new groups of questions (e.g. When the SQE ingests a verb that has not been categorized by the ontology, the verb is simply added to the index without a semantic annotation, such as the verb "ally," which has been indexed as "ally_verb, see para [0069]); and configuring new intent responses that provide information applicable to all of the new questions in the same new intent categories (e.g. the configuration process that permits an administrator to set up ontologies, dictionaries, sizing preferences for indexes and other configuration and processing parameters, see para [0080] and FIG.5).

- Please See Continuation Sheet .

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:
Box V.2. Citations and explanations:

As to claim 5, Koo further teaches the method according to claim 4 including: identifying any of the new intent categories associated with at least a pre-query threshold number of new questions (e.g. Each attribute is linked with other Intent Concepts via a pair of relations, ITD and DF, which semantically mean "X Intend To Derive Y" and its reverse-relation "Y can be Derived From X", and, optionally, a score (S) that indicates how strong such a derived intent is, see para [0021]); and posting the new intent responses for the identified new intent categories on a web page (e.g. Then possible search terms are determined (530) and displayed (540) based on possible intents. A user then selects one or more additional search terms, which are received (550) and possible intents are then determined (560), see para [0076] and FIG.5).

As to claim 6, Koo further teaches the method according to claim 5 including: Identifying any existing intent categories that are not associated with at least a lower threshold number of new questions (e.g. If the user selects additional Peer-term(s), the possible intents eventually will narrow to a single one, see para [0079] and FIG.8 and e.g. If found that the first-tier caching is not enough, then caching can occur at the second level, e.g., the peer-concepts per PAIR of symptoms, see para [0063]); and removing pre-query intent responses for any of the identified existing intent categories from the web page (e.g. By adding a new symptom/concept B, the system eliminates Y as a possible intent and refines the query to be "A+B", see para [0025]).

As to claim 7, Marchisio further teaches the method according to claim 6 including configuring at least some of the intent categories into an intent hierarchy that causes the intent responses associated with the intent categories to be displayed according to the configured intent hierarchy (e.g. a relationship query may provide a subject and/or object list as [entity] or [person] or [location/country], etc., which is interpreted as a type of node in an ontology hierarchy, see para [0186]).

As to claim 9, Koo teaches the method according to claim 8 including: identifying ontologies associated with the intent categories; presenting concepts in the identified ontologies for selection by a user; and displaying intent responses for the ontology parameters assigned to the intent categories. Marchisio teaches including: identifying ontologies associated with the intent categories (e.g. Synonyms are typically specified as properties of an ontology related to the corpus or in a dictionary, see para [0090]); presenting concepts in the identified ontologies for selection by a user (e.g. The user can select the "Show Roots" link 8A04 to show the roots of other ontologies available for that particular corpus, see para [0153] and FIGS.8A-8G); assigning any of the selected concepts as ontology parameters for the associated intent categories (e.g. the Relationship Query Processor 1210 is responsible for augmenting the specified Relationship Query 1209 in accordance with the current SQE configured parameters, see para [0168]); and displaying intent responses for the ontology parameters assigned to the intent categories (e.g. To perform this transformation, the ENLP determines the syntactic structure of the data by parsing (or decomposing) each data object into syntactic units, determines the grammatical roles and relationships of the syntactic units, associates recognized entity types and/or ontology paths if configured to do so, and represents these relationships in a normalized form, see para [0011]). It would have been obvious to one of ordinary skill in the art to combine the ontology path browsing capability of Marchisio with the Intended Concept processor of Koo, to provide the qualitative benefit of user-assisted ontology navigation sub-path identification and determination.

As to claim 13, Koo teaches the method according to claim 12 but fails to explicitly teach including using ontology elements associated with the enterprise information system as features for the clustering engine and then using at least some of the cluster names generated by the clustering engine to create intent categories. Marchisio teaches including using ontology elements associated with the enterprise information system as features for the clustering engine and then using at least some of the cluster names generated by the clustering engine to create intent categories (e.g. a corpus of documents is prepared for electronic searching by parsing each sentence into syntactic elements, normalizing the parsed structure to a plurality of tagged terms, each of which indicate an association between the term and a type of tag, and then transforming each sentence into a data structure that treats the tagged terms as additional terms of the sentence to be searched by a keyword search engine. In some embodiments, the tags include a grammatical role tag, a part-of-speech tag, an entity tag, an ontology path specification, or an action attribute, see para [0012]). It would have been obvious to one of ordinary skill in the art to combine the Syntactic Query Engine of Marchisio with the Intended Concept processor of Koo, to provide the qualitative benefit of being able to parse sentences into syntactic elements, meanwhile normalizing the parsed structure into a plurality of tagged terms, each of which being able to indicate the association between the term and a type of tag. and then transforming each sentence into a data structure able to treat the tagged terms as additional terms of the sentence to be searched by a keyword search engine.

As to claim 14, Koo further teaches the method according to claim 13 including: identifying queries that do not match any of the created intent categories (e.g. The system will only consider disease(s) in the row containing S as candidates (and/or eliminate all others do not contain S), see para [0034]); submitting the identified queries to the clustering engine (e.g. "clustering", statistically look for other words that often appear along with or near the keyword in the same query, and present these random words to user as guidance/hints for query expansions, see para [0006]); generating new cluster names for the clusters of non-matching queries (e.g. An artificially created conceptual "Quasi-Asthma" object, indicating the intent of a search user, see para [0022]); and using the new cluster names to generate additional intent categories (e.g. A user then selects one or more additional search terms, which are received (550) and possible intents are then determined (560). Due to the receipt of additional search terms, the intent may be determined, see para [0076] and FIG.5).

As to claim 15, Koo further teaches the method according to claim 14 including: automatically generating an intent hierarchy by identifying a new intent category having an associated set of queries that comprise a sub-set of queries for an existing intent category and identifying the new intent category as a child of the existing intent category (e.g. a system and method that enable the user to refine/expand his/her query using the predefined Intent Graph 400 as the navigation engine, see para [0026]); and identifying a new intent category having a subgroup of associated queries that comprise all of the queries matching an existing intent category and identifying the new intent category as a parent of the existing intent category (e.g. The graph indicates search terms A, B, C, D and related intents X, Y, and Z. A intends-to-derive (ITD) X or Y; B ITD X or Z; C ITD Y or Z; and D ITD X or Z. The search navigator 140 can then determine peer concepts (search terms) associated with X and Y and display them (e.g., A, B, C, and D). The user's subsequent selection of a peer concept will narrow down the possible intents, see para [0074] and FIG.4).

- Please See Continuation

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

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Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:
Box V.2. Citations and explanations:

As to claim 17, Koo teaches the search engine according to claim 16 but fails to explicitly teach wherein the processor is configured to operate an Intelligent Matching Language (IML) engine and use one or more ontologies to identify the concepts and linguistic formations in the queries. Marchisio teaches wherein the processor is configured to operate an Intelligent Matching Language (IML) engine and use one or more ontologies to identify the concepts and linguistic formations in the queries (e.g. the ENLP provides "co-referencing" analysis, which allows the ENLP to replace pronouns with nouns, or nouns, pronoun phrases, noun phrases, aliases, abbreviations, acronyms, etc. with a corresponding identifying noun, see para [0172] and FIG.16). It would have been obvious to one of ordinary skill in the art to combine Enhanced Natural Language Parser of Marchisio with the Intended Concept processor of Koo, to provide the qualitative benefit derived from the natural language parser of identifying, for each sentence received as input, the part of speech for each term in the sentence and the syntactic relationships among the various terms making up each clause of the sentence.

As to claim 18, Koo further teaches the search engine according to claim 17 including a memory that stores preconfigured intent responses for only a portion of most frequently queried intent categories and returns the preconfigured intent responses for the intent categories associated with the received queries (e.g. Embodiments of the invention pre-construct a set of artificially created constructs (namely "Intended Concepts" with the following basic attributes, see para [0022]).

As to claim 19, Marchisio further teaches the search engine associated with claim 18 wherein the processor is configured to conduct searches using concepts identified using the TML engine and the ontologies when no intent categories can be identified for the received queries and is further configured to conduct keyword searches when no concepts can be identified in the queries (e.g. Such classifications enable keyword searching based upon classifications of sentences as well as other syntactic and semantic tags, see para [0215] and FIG.30).

As to claim 20, Koo teaches the search engine according to claim 16 but fails to explicitly teach wherein the intent categories are arranged in intent hierarchies and the processor is configured to provide intent responses corresponding to locations of the intent categories in the intent hierarchies. Marchisio teaches wherein the intent categories are arranged in intent hierarchies and the processor is configured to provide intent responses corresponding to locations of the intent categories in the intent hierarchies (e.g. a relationship query may provide a subject and/or object list as [entity] or [person] or [location/country], etc., which is interpreted as a type of node in an ontology hierarchy, see para [0186]). It would have been obvious to one of ordinary skill in the art to combine Marchisio.s Syntactic Query Engine.s query processor with the Intended Concept processor of Koo, to provide the performance and qualitative benefit provided by the ability to transform a query so as to handle ontology path specifications or "types", if they are provided within the received query string.

As to claim 21, Koo teaches the search engine according to claim 16 but fails to explicitly teach wherein the intent categories include different parameters associated with different intent responses. Marchisio teaches wherein the intent categories include different parameters associated with different intent responses (e.g. the precise behaviors of each step depend upon the heuristics and other rules that are encoded, the preferences set for search parameters, and the way the normalized data is actually stored in the term-clause, term-sentence, and term-document indexes, see para [0184] and FIG.19). It would have been obvious to one of ordinary skill in the art to combine Marchisio.s Syntactic Query Engine.s query processor with the Intended Concept processor of Koo, to provide the performance and qualitative benefit afforded by the user interacting with the iterative keyword search facility of the SQE.

As to claim 22, Marchisio further teaches the search engine according to claim 21 wherein the parameters are associated with ontology concepts and the processor displays intent responses corresponding with the ontology concepts (e.g. the configuration process that permits an administrator to set up ontologies, dictionaries, sizing preferences for indexes and other configuration and processing parameters, see para [0080] and FIG.5). It would have been obvious to one of ordinary skill in the art to combine the Syntactic Query Engine.s query processor of Marchisio with the Intended Concept processor of Koo, to provide the qualitative benefit of being able to ingest an entire data set prior to conducting a search.

As to claim 24, Marchisio further teaches the search engine according to claim 21 wherein the intent responses include response parameters associated with additional intent responses and the processor is configured to identify elements in the queries associated with the response parameters and display the associated additional intent responses (e.g. the ENLP provides "co-referencing" analysis, which allows the ENLP to replace pronouns with nouns, or nouns, pronoun phrases, noun phrases, aliases, abbreviations, acronyms, etc. with a corresponding identifying noun, see para [0172] and FIG.16).

Claim 23 lacks inventive step under PCT Article 33(3) as being obvious over Koo and Marchisio in view of US 2005/0080775 A1 to Colledge et al. (hereinafter 'Colledge').

As to claim 23, Koo and Marchisio combine to teach the search engine according to claim 21 but fail to explicitly teach wherein the parameters are associated with types of user classifications or types of user operations performed by users submitting the queries. Colledge teaches wherein the parameters are associated with types of user classifications or types of user operations performed by users submitting the queries (e.g. identify advertisement that matches the characteristics of the end-user and the web site is to use a machine learning classifier to identify if the characteristics of the advertisement, including the advertisement, including the keyword senses, match those of the end-user or the web page, see para [0095]). It would have been obvious to one of ordinary skill in the art to combine the context-based advertising facility of Colledge with the enhanced Intended Concept processor of Koo and Marchisio, to provide the marketing benefit of targeting specific user categories, based upon the capability of machine learning, due to the nature and sequence of search strategies, as demonstrated through iterative queries.

Claims 1-24 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.